

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
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1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE February 20, 2002		3. REPORT TYPE AND DATES COVERED
4. TITLE AND SUBTITLE Collective Behaviors: Mass Panic and Outbreaks of Multiple Unexplained Symptoms			5. FUNDING NUMBERS	
6. AUTHOR(S) LTC Ross H. Pastel				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Commander, U.S. Army Medical Research Institute of Infectious Diseases 1425 Porter Street Fort Detrick, MD 21702-501			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION / AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE DISTRIBUTION UNLIMITED			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) The general public, the mass media, and many government officials believe that the use of weapons of mass destruction (WMD) will inevitably lead to mass panic and/or mass hysteria. However, studies of disasters and wars show that disorganized flight in the presence of a real or perceived danger (i.e., mass panic) is rare. On the other hand, in a real or perceived WMD scenario, outbreaks of multiple unexplained symptoms (i.e., mass psychogenic illness, mass sociogenic illness, mass hysteria, or epidemic hysteria) may be prevalent. Many of the symptoms (fatigue, nausea, vomiting, headache, dizziness/lightheadedness, and anorexia) are common in combat and after toxic chemical exposure, chemical weapon exposure, prodromal infectious illness, and acute radiation sickness.				
14. SUBJECT TERMS social effects, bioterrorism, epidemics, mass panic			15. NUMBER OF PAGES 3	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UNLIMITED	

20020405 081

Collective Behaviors: Mass Panic and Outbreaks of Multiple Unexplained Symptoms

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The general public, the mass media, and many government officials believe that the use of weapons of mass destruction (WMD) will inevitably lead to mass panic and/or mass hysteria. However, studies of disasters and wars show that disorganized flight in the presence of a real or perceived danger (i.e., mass panic) is rare. On the other hand, in a real or perceived WMD scenario, outbreaks of multiple unexplained symptoms (i.e., mass psychogenic illness, mass sociogenic illness, mass hysteria, or epidemic hysteria) may be prevalent. Many of the symptoms (fatigue, nausea, vomiting, headache, dizziness/lightheadedness, and anorexia) are common in combat and after toxic chemical exposure, chemical weapon exposure, prodromal infectious illness, and acute radiation sickness.

Introduction

Although much attention has focused on individual behavioral determinants, relatively little has focused on social determinants. In disaster situations, especially disasters caused by weapons of mass destruction (WMD), collective behaviors may be important. This review focuses on mass panic and on outbreaks of multiple unexplained symptoms (OMUS).

The mass media and many government planners seem to think that mass panic will be the predominant behavior in a WMD scenario. Most disaster movies have a scene of a "wildly excited crowd behaving in an impulsive, completely disorganized fashion, each person abandoning all social values in a desperate effort to save himself."¹ Prior to World War II, the British government assumed that German bombing raids would produce this effect as did U.S. Civil Defense planners in the 1950s. However, an extensive literature review of bombing raids on England, Germany, and Japan found little evidence of mass panic incidents.¹ Studies of civilian disasters also found little evidence of mass panic.² In fact, mass panic is a rare response to disaster and, typically, occurs only in situations characterized by obvious physical danger and limited escape routes.^{3,4} Such conditions are found in only a limited number of situations like inside burning buildings, aboard sinking ships, in mine fires or explosions, and on battlefields. The first use of chlorine gas during World War I produced panic, but subsequent attacks in 1915 did not.⁵ Only four other examples of gas panic were reported during World War I, two of which involved poor training and drill in use of the gas mask.

At least part of the confusion regarding mass panic may be

the indiscriminate use of the term. A good definition of mass panic is "an acute fear reaction marked by loss of self-control which is followed by nonsocial and nonrational flight."³ However, the media and others tend to refer to mass anxiety situations as panics. Perhaps the most famous incident of "mass panic" was Orson Welles' 1938 Halloween broadcast of "The War of the Worlds" when "Long before the broadcast had ended, people all over the U.S. were praying, crying, fleeing frantically to escape death from the Martians. . . . At least six million people heard the broadcast. At least a million of them were frightened or disturbed."⁶ However, there were very few press reports of mass panic, and Cantril's limited study revealed no cases involving mass panic. The one million frightened or disturbed (not panicked) people were extrapolated from 99 interviews. The power of the mass media to create or magnify mass anxiety has been demonstrated by numerous incidents including the Phantom Anesthetist of Mattoon, Ghost Rockets in Sweden, the Three Mile Island nuclear accident, and the Alar-poisoned apple scare.⁷⁻¹⁰

"Outbreaks of multiple unexplained symptoms" is a relatively neutral phrase to describe the phenomenon referred to by more pejorative phrases such as "mass hysteria" and "mass psychogenic illness." Several excellent reviews on the OMUS phenomenon are available.¹¹⁻¹⁴ The most recent review contrasted outbreaks occurring between 1973 and 1993 to outbreaks reported in an older review and occurring between 1872 and 1972.^{11,14} The majority (approximately 50%) of outbreaks in both reviews occurred in schools. Over time, occurrences in towns decreased from 24% to 10%, and occurrences in factories increased from 8% to 29%. In the earlier time period, more than two-thirds of outbreaks involved less than 30 people; in the recent time period, almost two-thirds involved more than 30 people.

Based on the reviews, the majority of outbreaks are triggered by an event, although rumors can also trigger outbreaks. The most common triggering event is an odor or perception of an odor, especially a gas. Environmental events (including nuclear accident releases, smog, contamination of a water supply, or mass chemical exposure of a community) have also triggered outbreaks. Outbreaks are enhanced by the population's physical or visual proximity to casualties, the general excitement of the event, the presence of media at the scene, the media reporting, litigation and/or compensation, labeling of the illness with a specific diagnosis, and the persistence of rumors.

The most common symptoms reported are nausea, vomiting, headache, and dizziness or lightheadedness, with more than 50% of those questioned reporting each of the symptoms.¹¹ Other common symptoms (reported by more than 20% of those questioned) include abdominal distress, weakness or fatigue, fainting or unconsciousness, hyperventilation, and anxiety or fright. The symptoms are ubiquitous and nonspecific. For ex-

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Presented at The Operational Impact of Psychological Casualties from Weapons of Mass Destruction (WMD), Bethesda, Maryland, July 25-27, 2000.

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This manuscript was received for review in August 2001. The revised manuscript was accepted for publication in October 2001.

ample, they are also reported by casualties following exposure to chemical, biological, and radiological agents, by soldiers with battle fatigue, and by people suffering common infections such as influenza or food poisoning.

OMUS can occur in military as well as civilian populations. One recent OMUS occurred midway through an 8-week training schedule at an all-male military recruit training center in San Diego, CA.¹⁵ The trigger was the perception of exposure to an airborne toxin after supper. At least eight recruits were hospitalized, 375 were taken to a hospital for medical evaluation, and 1,000 reported at least one symptom. Prevalent symptoms (reported by more than 20% of patients) included cough, light-headedness, chest pain, shortness of breath, headache, sore throat, dizziness, and nausea. Very few objective physical findings were observed, and no toxins were discovered by air sampling.

Outbreaks of gas neurosis occurred during World War I when soldiers experienced gas-poisoning symptoms (e.g., dyspnea, coughing, headache, and burning of skin) without significant exposure to gas.¹⁶ In one outbreak, more than 500 battle-tested soldiers became casualties during an 8-day period. The divisional gas officer found no evidence of gas inhalation or burning.

Most often OMUS is thought of as a diagnosis of exclusion; that is, if you can rule out a physical exposure to a toxic agent, what remains is OMUS. However, OMUS is not an either/or phenomenon; OMUS not only can co-occur with a toxic exposure but also can amplify the outbreak.¹⁷ The result can be a dramatic increase in the number of casualties, most of whom do not suffer from physical exposure. Unfortunately, most reviews of OMUS have not included examples of co-occurrence.

WMD agents are especially likely to induce OMUS. The most dramatic example is the radiological contamination incident in Goiania, Brazil, in 1987. Scavengers removed a cesium-137 source from an abandoned radiotherapy clinic and dismantled it for scrap metal.¹⁸ During a 2-week period, many people were exposed to external and internal doses of radiation, and four people died. Only 249 people were contaminated; but to discover them, 112,000 people were screened for radioactive contamination in the first 2 weeks and a total of 125,800 were screened over a 7-month period. Of the first 60,000 screened, 5,000 had symptoms of vomiting, diarrhea, and rashes around the face and neck. Although these symptoms are consistent with acute radiation sickness, none of the symptomatic people were contaminated.

In the Persian Gulf War, Iraq attacked Israel with Scud missiles. Initially, there was concern that the missiles would contain nerve agent. In a study of people reporting to the emergency room at hospitals in Israel following the initial missile attack, there were 22 people physically injured, 172 psychological casualties, and 171 who injected themselves with atropine for fear that the missiles contained nerve agent.¹⁹ Thus, less than 10% of the casualties in the initial missile attack suffered from a physical injury.

The current buzzword for OMUS is the "worried well," an unfortunate choice. First, although the people are worried, they may have good reason. Many of the WMDs are invisible; therefore, there is an extreme uncertainty regarding actual exposure to an agent. In addition, there is an uncertainty as to the potential long-term effects of exposure. The term "worried well" im-

plies that the symptoms are not real but exist only in the mind. However, the "worried well" are not well; they are suffering from real symptoms that cause real pain and real distress. The U.S. military experiences in World War I and World War II with shell shock and combat exhaustion demonstrated that terminology was very important, both for prognosis and treatment. Terms such as "war neurosis" or "psychoneurosis" had a stigma of mental illness and had a poorer prognosis, but terms such as "combat exhaustion" suggested a normal reaction to an abnormal stimulus and gave a positive expectation of recovery and return to duty following a short respite from the war.

There is a need for terminology to replace "worried well." The new terminology should be nonjudgmental and should not imply mental illness or weakness. All terminology should be used consistently with one accepted meaning. Currently, "mass panic" has multiple meanings rather than the narrow meaning used in this paper. The use of "mass hysteria" and "mass psychogenic illness" should be discontinued due to the pejorative connotations.

In summary, mass panic will be rare in WMD scenarios. However, mass anxiety and OMUS will be common. OMUS can occur with both perceived and actual exposures to toxic agents, which means that differential diagnosis at triage will be important. It is essential to remember that the physical symptoms are real; the uncertainty is their origin—physical, psychological, or mixed. Current terminology can exacerbate problems and prolong suffering following WMD scenarios. New terminology needs to be developed.

Acknowledgments

The author thanks the many AFRRI staff who discussed this topic with me, especially Dr. Gregory Knudson, Dr. Michael Landauer, LTC Charles Salter, and Dr. Michael Shoemaker. The author also greatly appreciates the assistance received from Ms. Donna Solyan and the AFRRI editorial, graphics, and audiovisual staff.

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